



VOLUME 64 ISSUE 1

January 2014

ARRL AFFILIATED-SPECIAL SERVICE CLUB

January Activities

Ham Breakfast

The Bistro/North End Diner
Saturday Jan 4
8:00AM-9:30AM

Board Meeting (Daniel's Taco)
Monday Jan 6
6:30PM - 8:00PM

Monthly Club Meeting (IHOP)
Wednesday Jan 9
6:00PM-9:00PM

PPRAA and ECOM Nets

PPRAA HF/VHF/UHF SSB
Every Thursday
7:00 PM
Start on 28.390
50.125 and 144.200

PPARES (146.97- 100Hz)
Every Tuesday
7:00 PM

PPARES (144.220 USB)
Every Monday
7:00 PM

PPRAA - AN ARTICLE OF INCORPORATION

Pikes Peak Radio Amateur Association (PPRAA) was established in the early-to-mid-1930s. Unfortunately we have not yet been able to ascertain the exact year of establishment. In Nov-Dec Ø-Beat publication the first two articles of incorporation were introduced, the third article of incorporation listed is:

To take, hold, purchase, lease, exchange, improve, operate, develop, trade, deal in and otherwise acquire real and personal property and interests therein for the education, enlightenment, amusement, recreation, physical culture and social enjoyment of all persons who may at any time become members thereof, and to promote, improve, develop, operate, use and enjoy any properties which may be so acquired to further its technical and social activities.

JANUARY MEETING HOMEBREW – SHOW-AND-TELL

If you designed it, built it - bring it.
If you thought it, constructed/bought it - bring it.
ECOM, Contest, Rag Chew, DX, your idea - show it.

If something is too big to bring, send pictures to zerobeat@ppraa.org and I'll add them to a media presentation.

PIKES PEAK ARES

(Submitted by: John Bloodgood, PPARES Publicity Officer)

The local ARES introduction and local net information can be found online at: www.ppares.org/files/General/ppares_intro.pdf.

Big news for Pikes Peak Amateur Radio Emergency Service (PPARES) was the announcement of Dr. Rich Russel, ACØUB, moving up to the Colorado Region 2 (South Central) Emergency Coordinator (EC) position and Don Johnson, KØDRJ, taking the EC position for Region 2 District 2 (PPARES).

PPARES is already getting requests for support of special events in 2014 and plans are underway for the annual SkyWarn Appreciation Day in December -- Sid White, K4ARM, the PPARES Weather Operations guru made the announcement tonight on the weekly PPARES net.

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PPRAA OFFICERS AND BOARD MEMBERS

President	<i>Michael Derbort</i>	<i>KCØELG</i>	<i>Board member</i>	<i>Tom Brereton</i>	<i>WØTOM</i>
Vice President	<i>Jim Bishop</i>	<i>KDØKQL</i>	<i>Board member</i>	<i>Doug Nielsen</i>	<i>N7LEM</i>
Secretary	<i>John Wishart</i>	<i>NGØI</i>	<i>Board member</i>	<i>Diana Nordstrom</i>	<i>KCØNPP</i>
Treasurer	<i>Pam Scott</i>	<i>WØPRS</i>	<i>Board member</i>	<i>Jim Rader</i>	<i>KDØNQM</i>
			<i>Board member</i>	<i>Jim Harris</i>	<i>WØEM</i>
			<i>Board member</i>	<i>Virgil Yost</i>	<i>NØXRS</i>
Ø-Beat Editor	<i>Dan Scott</i>	<i>WØRO</i>	<i>Board member</i>	<i>Chris Schroeder</i>	<i>KDØUQI</i>

All PPRAA board of directors can be contacted at: boardmembers@ppraa.org

All PPRAA officers can be contacted at: officers@ppraa.org

PPRAA SCHOLARSHIP FUND

Your contribution will make an enormous difference to some deserving student. PPRAA strives to raise \$1,000 yearly. Please make a tax deductible donation of \$5, \$10, \$20 or more. 2013 goal has been met. Yeah!

ONLINE DONATIONS:

<http://ppraa.org/donations>

SEND CHECKS TO (OR BRING TO A MEETING)

Write check to: "PPRAA Scholarship"
PPRAA-Scholarship Fund
PO Box 16521
Colorado Springs, CO 80935-6521

ANONYMOUS DONATION TO: THE FOUNDATION FOR AMATEUR RADIO:

Write Checks to: "PPRAA Scholarship"
FAR Scholarship Committee
P.O. Box 911
Columbia, MD 21044

WGØAT – GOAT UPDATE

From: HamRadioSchool.com

Goat Update! Following the untimely passing of Rooster Goat over a month ago, Steve has not one, but TWO new pals joining Peanut's gang: Barley & Acorn Goat! Barley and Acorn will be learning the Colorado mountain climbing ropes soon with Steve, and it won't surprise us to see them in a (WØTLM) Technician Class soon so they can back up Steve on the air just as well as Rooster did in his day.

See Peanut's introduction to Barley & Acorn here:

http://www.tietybe.cin/watch?v=kfBTgUIA_GY

Congrats on the new climbing comrades, Steve! Welcome to Colorado, Barley & Acorn! We look forward to seeing your ham radio exploits with Steve very soon!

~HRS Staff

PRESIDENTS MESSAGE

Hello Everyone,

I am honored to be asked to serve as your President for another year. I hope that all of you have had a wonderful Christmas and holiday season.

First of all I want to thank the past and now current board for the interest and support in the club. The last year has been extremely challenging for many of you. From changes in the economy and workforce to dear friends becoming silent keys.

Over the past four years we have seen some remarkable changes to our club and organization.

- We've established an annual scholarship fund and have awarded over \$3,000 in scholarship awards to deserving students seeking a degree in the sciences or technology fields.
- We have sponsored a few DX expeditions including the Malpelo Island expedition of 2012.
- We have completely redeveloped our website, created a forums section and expanded our social media presence on Facebook.
- We have made great progress in establishing a new club station and have had several successful field day events at that location.
- We continue to be the lead sponsors of the Colorado QSO party and support our regional ARRL Rocky Mountain section annual HamCon event.
- Through our partnerships with PPARES we have continued to provide the critical support to our community in times of natural disasters and have seen this recognized at the national level.

This year, 2014, is shaping up to be a wonderful year, we will see the Pikes Peak Radio Amateur Association celebrate over 75 years of service to the Pikes Peak region. As always we are hoping to have a big turnout at our annual Megafest



Terry Kift, KDØJAX submitted this picture of his 2M/440CM ice encrusted antenna.

Terry took the picture the morning of December 21st after a few days of freezing fog.

As if an antenna isn't enough, there are nice artistic touches with the moon and sunrise-red mountains as part of the background scenery. Unfortunately the background is not easily seen in this scaled down picture.

event. We have some great door prizes this year including an ICOM-51H HT donated by the Cheyenne Mountain Repeater Group. We also have an Elecraft KX3, a Rig Expert AA54 antenna analyzer, a Butternut HF9V vertical antenna, and other great prizes. We are planning on two special events this year to occur sometime this summer. Aligned with our annual picnic we are hoping to hold a special event celebrating our 75 years of service to the Pikes Peak region. We are also planning on a special event with our local Boy Scouts to hopefully encourage youngsters to get their Amateur Radio License and to help with merit badges, etc. We are in our early planning stages at this time and hopefully have some more details for you soon.

I do want to take a moment and talk about the elections. First let me start by a famous quote by Albert Einstein, "The definition of Insanity: doing the same thing over and over again and expecting different results." Comparing this to the last election I see a lot of the same faces being reelected to our Board. I want to strongly encourage all of you who have not served as a Board Member or Officer of our club to consider doing so. New and fresh ideas will help this organization continue to grow and support our community.

As with any non-profit organization we cannot be successful without the support of our membership. So if you have not renewed your membership I encourage you to do so. Also consider making a pledge to support our strategic initiatives. Whether that is a financial or time donation we cannot do it without you.

73,

Michael Derbort, KC0ELG
President
Pikes Peak Radio Amateur Association

ARRL Board of Directors

The ARRL Board of Directors convenes twice a year to represent their Divisions on ARRL policy matters, its first meeting of 2014 taking place in January. Your concerns, questions, and ideas regarding ARRL policies are always welcome.

As always, please help us better represent you by sharing your thoughtful feedback on League matters that are important to you.

Our Division website (www.RockyMountainDivision.org) has continued to serve as a source of Division related information. How to send comments can be found here.

PPRAA CHRISTMAS PARTY

Dick, W0RAA, submitted photos taken at the PPRAA Christmas and Holiday Party during the December meeting. Fun kibitzing (eyeball QSO) time had by all! Many won some very nice prizes. The drawing was from the tickets collected throughout the year at PPRAA meetings and events. The more meetings and events attended the greater the chance to win!



Left:
Christopher (KDØUQI),
Mike (WV7T) and Rhoda (K2BZY)



Right:
Virgil (NØXRS) and Patty



Left:
Peggy and Jim (KDØNQM)



Right:
Jim (KDØKQL)



Left:
Cheri and Doug (WØMHP)



Right:
Gerry (NMØQ), Kathy (KMØL)



Left:
Michael Derbort (KC0ELG)



Right:
Sue and Galen (AGØA)

Although the above pictures represent just a few at the party, we hope you all had a wonderful holiday season and will have a prosperous New Year!

USE YOUR FREQUENCY WISELY

Found on "The KØNR Radio Site" (www.k0nr.com)

Bob, KØNR, is a long time member or PPRAA

You've just purchased your first 2M FM transceiver and have been chatting with both old and new friends around town on the 2M band. You and your buddies decide to find an out of the way frequency to hang out on. After tuning around, you find a nice, quiet frequency that no one seems to be using and start operating there. Nothing to worry about, right? *Not so fast, there are a few more things to consider when selecting a frequency on the 2M band. Let's take a look at the key issues.*

FCC RULES

The first thing we need to know are the frequencies that the FCC has authorized for our particular license class. For the HF bands, the frequency privileges depend greatly on the license class of the operator. Above 50 MHz, the frequency allocations are the same for Technician licenses and higher. In particular, the 2M band extends from 144 MHz to 148 MHz. The FCC Rules say that any mode (FM, AM, SSB, CW, etc.) can be used on the band from 144.100 to 148.000 MHz. The FCC has restricted 144.0 to 144.100 MHz to CW operation only.

BAND PLANS

Knowing the FCC frequency authorizations is a good start but we need to check a bit further. Amateur radio operators use a variety of modulation techniques to carry out communications. Often, these modulation techniques are incompatible since a signal of one type can't be received by a radio set to another modulation type. For example, an SSB signal can't be received on an FM receiver (and vice versa). We need to use our authorized frequencies wisely by sharing the band with other users and avoiding unnecessary interference. Thus, it makes sense to have a *band plan* that divides the band up into segments for each type of operation.

2M BAND PLAN

As shown in the table, the 2M amateur band plan supports a wide variety of radio operation. Large portions of the band are dedicated to FM operation, consistent with the popularity of the FM mode. There are portions of the band designated for repeater *outputs* (which is the frequency that we tune to receive the repeater) and repeater *inputs* (which is the frequency we transmit on to use the repeater). Notice that these segments are positioned 600 kHz apart consistent with the standard 2M repeater offset. There are also frequencies designated for FM simplex. On the low end of the band, we see segments for some of the more exotic modes. At the very bottom is the CW portion, which includes Earth-Moon-Earth (EME) operation. EME operators communicate by bouncing their signals off the moon. Further up the band, we see segments for SSB operation and beacon operation. SSB is the preferred voice mode for so-called "weak signal"

2M Band Plan

As approved by the ARRL VHF-UHF Advisory Committee, simplified by KØNR to reflect usage in Colorado.

The [Colorado Council of Amateur Radio Clubs](#) (CCARC) publishes the official [2 Meter Frequency Use Plan](#) for the 2 Meter band in Colorado.

144.000-144.100	CW
144.100-144.275	Single-sideband (SSB Calling Frequency = 144.200)
144.275-144.300	Propagation Beacons
144.300-144.500	OSCAR (satellite) APRS Frequency = 144.390 MHz
144.500-144.900	FM Repeater Inputs
144.900-145.100	Packet Radio
145.100-145.500	FM Repeater Outputs
145.500-145.800	Misc. and experimental modes
145.800-146.000	OSCAR (satellite)
146.010-146.385	FM Repeater Inputs
146.400-146.595	FM Simplex (National Simplex Frequency = 146.52 MHz)
146.610-147.390	FM Repeater Outputs
147.405-147.585	FM Simplex
147.600-147.990	FM Repeater Inputs

Note: The FM channel spacing in Colorado is 15 kHz (repeaters and simplex).

operators. The mode is more efficient than FM when signals are weak, so it is the way to go when you are trying to push the limits of 2M DX. Beacons are transmitters that are always on, transmitting a short CW message as a propagation indicator for distant

stations. We often think of 2 Meters as a local coverage band but when conditions are right, contacts can be made with stations over a thousand miles away. Of course, conditions are not always right so having a beacon on the other end of the desired communication path lets you know how propagation is in that direction.

Radio amateurs also use 2 meters for OSCAR satellite operation, sending signals *to* a satellite (uplink) or receiving signals *from* the satellite (downlink). The OSCAR segments don't specify a particular modulation type since CW, SSB and FM are all used for OSCAR operation. Because of their elevation above the earth, satellites can hear signals from all over the US simultaneously, so they are very susceptible to interference.

Most of this non-FM operation can be easily interfered with by signals from other users. EME signals, for example, are usually quite small since the signal has to make the round trip from the earth to the moon and back. If a local FM operator fires up in the EME portion of the band, an EME signal that can't be heard by an FM receiver can be wiped out by the FM signal. Similarly, an operator chatting across town on 2M could interfere with a satellite hundreds of miles away and not know it. This is particularly a problem with FM receivers, which won't even notice low level CW and SSB signals.

FM OPERATING

The most common 2M rigs are basic FM mobile or handheld transceivers. These radios usually tune the entire 2M band from 144 MHz to 148 MHz in 5 kHz steps. The band plan indicates the proper range of frequencies for FM operation but there is more to the story. FM operation is "channelized", meaning that specific 2M FM frequencies are identified by the band plan. The use of channels is especially important for repeaters, since they don't easily move around in frequency and are coordinated to minimize interference. The idea is to have all stations use frequencies that are spaced just far enough apart to accommodate the signal without interfering with the adjacent channels.

You might think that the spacing between channels would be 5 kHz, which is the tuning step of most FM radios. This doesn't work because an FM signal occupies a bandwidth that more than 5 kHz wide. Even though we talk about a signal being on a specific frequency, the signal actually spills out on either side of the frequency by about 8 kHz. This means that a typical FM signal is about 16 kHz wide.

(You may recall that amateur 2M FM uses ± 5 kHz frequency deviation. So doesn't this mean the bandwidth is 10 kHz? No, it doesn't work quite that way and the signal is actually wider than 10 kHz. I might be able to show the math behind this but it makes my head hurt. Maybe I will cover this in some future article.)

2M FM Simplex Frequencies Colorado Band Plan	
146 MHz Range	146.400, 146.415, 146.430, 146.445, 146.460, 146.475, 146.490, 146.505, 146.520 , 146.535, 146.550, 146.565, 146.580, 146.595
147 MHz Range	147.405, 147.420, 147.435, 147.450, 147.465, 147.480, 147.495, 147.510, 147.525, 147.540, 147.555, 147.570, 147.585

The channel spacing needs to be at least as wide as the bandwidth of the signal, which allows room for each signal without interfering with the adjacent channel. In Colorado, the channel spacing is 15 kHz, which is a bit tight for our 16 kHz-wide signal. In other parts of the country, a 20 kHz spacing has been adopted to provide for more separation between channels. Obviously, you get more channels on the band with 15 kHz spacing than with 20 kHz, but you have to put up with more adjacent channel problems.

When using a repeater, you just need to dial in the published repeater frequency and set the transmit offset, either + 600 kHz or - 600 kHz. Most modern 2M radios automatically take care of setting the proper offset (based on the band plan). If you need to set the offset manually, the rule is very simple. If a repeater's output frequency is in the 147 MHz range, it uses a + 600 kHz offset. Otherwise, it requires a - 600 kHz offset. For repeaters that require a CTCSS tone for repeater access, you will have to set the proper tone frequency on transmit.

For simplex operation, the standard simplex frequencies listed in the table below should be used. These simplex frequencies are grouped in the 146 MHz and 147 MHz range as listed in the table below. The National Simplex Frequency (also referred to as the calling frequency) is 146.52 MHz.

A picture of your shack, mobile installation, antennas could go here!

*Send pictures, articles, and small posts to:
zerobeat@ppraa.org*

SOME COLORADO SPRINGS VHF/UHF FREQUENCIES

Simplex 146.460 Maybe the most active COS Frequency
 Repeater 447.725- 100Hz; Bob's (KØNR) Monument:
 Repeater 146.97- 100Hz; Wide area coverage (PPFMA)
 Repeater 147.345+ 107.2Hz; Wide area coverage (CMRG)
 Repeater 50.130- 107.2Hz; 6Mtr (CMRG)
 Repeater 448.450- 100Hz; Wide area coverage (PPFMA)
 Repeater 448.100- 107.2Hz; Wide area coverage (CMRG)

Repeater 146.91- 151.4Hz; Local COS (GGARC)
 Repeater 147.39- 103.5Hz; Local (WØMOG Barry Cook)
 Repeater 927.8- 116Hz; Local (WØMOG Barry Cook)
 Repeater 927.85- 114Hz; Local (CMRG)
 Repeater 145.375- DSTAR (CMRG)
 Repeater 446.9125+ DSTAR (CMRG)
 Repeater 446.8875- DSTAR (WØTLM Monument)

DISCOVERING AMATEUR RADIO

Towards the power and possibilities of amateur radio

PPRAA email reflector: by Wes Wilson, K0HBZ

This is a top-notch, impressive, professional new video on Amateur Radio and RF applications and opportunities around the world.

Good emphasis on Amateur Radio EmComm applications. Recommend every ham bookmark this video for future use in promotion of Amateur Radio. It's available in a "Full" and "Condensed" versions depending upon the presentation audience and venue.

Discovering Amateur Radio
 Written & Narrated by K1AN
www.RadioQRV.com

Discovering Amateur Radio - Full Version World Genesis Foundation YouTube Video, runtime 32:14
<http://tinyurl.com/jwfxz7p>

Discovering Amateur Radio Condensed Version YouTube Video, runtime 19:45 <http://tinyurl.com/kwqj5lp>

73 Wes KØHBZ

ROCKY MOUNTAIN DIVISION AWARDS

CALL FOR NOMINATIONS

There are many hams within our great Division who deserve to be recognized for their achievements and contributions to the ham community – and we'd like to honor them. Your Rocky Mountain Division offers the following annual awards:

- Rocky Mountain Division Ham of the Year Award
- Rocky Mountain Division Young Ham of the Year Award
- Rocky Mountain Division Technical Achievement Award

Complete details, rules and a nomination form can be found on the Division website (www.RockyMountainDivision.org). Please give some thought to hard working hams in your area, or within your club and consider submitting a nomination.

30 YEARS AGO – JANUARY 1984

January 1984:

- Since VE testing will soon be allowed by the FCC, there is a lengthy article about the facts of VE testing.
- Colorado Springs will host the next CCARC meeting on March 17.
- Ongoing discussion at the club meeting about whether or not the club should acquire and operate a repeater.
 - o Frank KL7IPV presented a proposal for a repeater.
 - o A committee was established to determine the questions concerning a repeater for the club.
- The January meeting will be held at the Palmer House Motel on North Chestnut, just N of I-25 and Fillmore.
- The PPRAA is working more closely with the American Red Cross and will help by publishing a list of ARC classes in the Zero Beat.
 - o These courses are CPR, and standard and advanced first aid.
- This year's swapfest may turn into a hamfest. The board discussed the possibility of a larger location, a two-day event, and maybe even charging admission.
 - o The swapfest budget was \$200.
 - o Frank KL7IPV agreed to take over the duties of Editor.
 - o Board member Charlie Biggs KCØTI resigns due to personal conflicts.

2014 ROCKY MOUNTAIN DIVISION CONVENTION

Save the date

The good folks in Wyoming are in the midst of planning the 2014 Division Convention, to be held at the Laramie Convention Center in Laramie, Wyoming.

Mark your calendars for July 11-13, 2014 for a special convention, packed with many of the activities and events our Division's conventions have become known for next year, the centennial anniversary of ARRL.

Many more details are forthcoming and will be announced in these spaces.

SOCIAL MEDIA

PPRAA.ORG

The PPRAA.org web site provides additional club information, useful links, propagation information and much more.

PPRAA.FORUMOTION.NET

Very lightly used. This is intended to allow on-going discussion on area amateur radio activities.

FACEBOOK

From the link on PPRAA.org, in Facebook find "PPRAA-Pikes Peak Radio Amateur Association".

GOOGLE+

From the link on PPRAA.org, in Google+ find "PPRAA-Pikes Peak Radio Amateur Association".

PPRAA MEETING LOCATIONS

"HAM" BREAKFAST

All are warmly invited to come on down and join us!

The Bistro/North End Diner

1228 E Fillmore

Saturday, 4 January 2014

Time is from 8:00-9:30 AM

The "HAM" breakfast is generally held the first Saturday of the month with periodic QSY to other dates based on QRM of other local or state activities.

The "HAM" Breakfast location moves around town providing an occasional location near you

MEMBERSHIP MEETING



IHOP on Stetson Hills Blvd

5749 Stetson Hills Blvd

(Just west of Powers Blvd)

November 13th 7 pm

The General membership meetings are open to all amateur radio operators, those interested in amateur radio, and guests. This meeting consists of club business and interesting presentation. The meetings are the 2nd Wednesday of the month.

Most people will order off the menu starting around 6:00 PM. Eat and enjoy meeting new (or old), friends over the meal



Daniel's Taco Shop

6817 Space Village Ave

(Just outside the north gate of Peterson AFB)

Board Meetings are open to all members.

Meeting starts at 6:30 PM

THURSDAY NIGHT NET

Every Thursday evening (some holiday exceptions) the PPRAA holds a net starting on 10 Meter at 28.390 USB. Other USB frequencies commonly used during the net are 50.125, and 144.220. The net is open to all licensed amateur radio operators.

General net where checking out your equipment is encouraged. New antennas, microphones, radios, mobile setup, whatever, can be discussed as you tweak your station.

ARRL HELPS MANUFACTURER RESOLVE AFCI RFI PROBLEMS

ARRL's Lab staff recently kicked off a productive working relationship with Eaton Corporation, a manufacturer of arc fault circuit interrupter (AFCI) breakers, to resolve problems reported by amateur radio operators that caused certain breaker models to trip unnecessarily due to RF, even if the RF source was stood off by a significant distance. Like the more common ground fault circuit interrupter (GFCI), the AFCI is a safety device that is mandated by code in some household circuits that detect potentially hazardous arc faults due to poor connections in wiring and other factors.

Several amateur radio operators around the country, including George Key W5YZ of Bernalillo, New Mexico and other members of the High Desert Amateur Radio Club, provided reports and test data to Mike Gruber W1MG, ARRL Lab's EMC specialist that kicked off a series of events including Eaton AFCIs being tested in close proximity to W1AW's high power bulletin stations with Eaton representatives present, Eaton engineers

prototyping a new AFCI model that is less susceptible to RFI, and verifying its immunity back at W1AW. Eaton and ARRL further agreed that future AFCI models would be tested at W1AW.

A complete write-up about this successful industry partnership and RFI resolution, including steps for anyone who's experiencing similar problems with Eaton AFCIs can be found at <http://www.arrl.org/news/arrl-helps-manufacturer-to-resolve-arc-fault-circuit-interrupter-rfi-problems>

One of the ARRL Lab's (<http://www.arrl.org/arrl-lab>) mission areas is to have a comprehensive RFI program in place that helps members with RFI problems and to work with industry standards, organizations, helping to prevent RFI problems before they happen. If you are experiencing RFI problems with other brands of AFCI breakers, please contact Mike Gruber W1MG (w1mg@arrl.org).

SOFTWARE DEFINED RADIO

Pam, WØPRS, PPRAA Treasurer operating 40 Meters using a Flex5000 Software Defined Radio.



Definitions from a Wiki:

Software defined radio (SDR) is a radio communication system where components that have been typically implemented in hardware (e.g. mixers, filters, amplifiers, modulators/demodulators, dectors, etc.) are instead implemented by means of software on a personal computer or embedded system. While the concept of SDR is not new, the rapidly evolving capabilities of digital electronics render practical many processes which use to be only theoretically possible.

NOTE: The Elecraft KX3 and Megafest prize is an example of an embedded SDR Implementation.

MFJ MEMORY KEYER RESET

From: WWW.WRBISHOP.COM Posted on April 20, 2013: Bill Bishop, NCØNK

The other day when I tried to power-up my MFJ-492X memory keyer, all I got was a short, low frequency "bzzz". The lights down the left side of the front panel cycled as normal, but it wouldn't generate any tones.

In the process of tracking down any power issues (including the internal 9V battery), I discovered the 3V Lithium battery (CR2430) had gone flat (0.0V). After replacing it (I had stuck a spare to the top inside



Going through the "usual" suspects, re-seating all the chips & connectors, didn't work either. So I fired off a quick email to MFJ, and within hours, the answer appeared:

Hold down all 6 buttons while turning the power on (a bit tricky).

At this point the sweet "dash-dash-dash dash-dot" (ON) enunciated

of the box), at power-up, the unit would only give a long (4-5 second) "bzzzt". Trying the (factory) reset procedure in the manual (holding the menu button down while powering-up) made no difference.

clearly, and things have been fine ever since. Kudos to MFJ for their customer support; the unit is only 20+ years old 😊

PROTECT YOUR GEAR FROM ESD

Submitted by: Dan Romanchik, KB6NU

Electrostatic discharge, or ESD for short, has been a concern for anyone involved in electronics ever since we made the transition from vacuum tubes to transistors. I was schooled about ESD when I worked as a test engineer for a company called Doric Scientific shortly after I got out of engineering school, and I wrote about it when I was an editor for Test & Measurement World magazine back in the 1990s. If anything, it's even more of a concern today as electronic components get ever smaller.

In 1991, Bryan P. Bergeron, NU1N, published a two-part series on ESD part 1: <http://www.arrl.org/files/file/Technology/tis/info/pdf/9104019.pdf>, Part 2: <http://www.arrl.org/files/file/Technology/tis/info/pdf/9105028.pdf> in QST. His suggestions about how to prevent ESD damage are as good now as they were 20 years ago:

- Consider using a room humidifier to increase the relative humidity in your shack, or wherever you work on electronic equipment to 65% RH or higher.
- Use grounded wrist straps when handling ESD-sensitive devices.
- Use grounded anti-ESD work mats when working on electronic equipment.
- Use a grounded soldering iron and anti-static tools.
- Use anti-static bags and containers for storing and transporting electronic equipment.
- Connect the chassis of all your gear to a good earth ground.

- Consider purchasing a desktop ionizer to neutralize static buildup on your workbench.

I might also add consider grounding the chairs that you use in your shack or discharging yourself after getting up from the chair in your shack. I know that the worst electrostatic discharges that I experience are after I get up from my chair. You can even buy ESD-safe chairs (http://www.all-spec.com/products/Benches_and_Chairs%7CChairs_and_Accessories%7CCHR-00/), but they are kind of expensive.

Personally, I use an anti-static mat that I originally purchased for use with a computer keyboard and a wrist strap that was given to me by an ESD consultant when I worked for the magazine. I use these religiously when building kits or working on any solid-state gear.

It's not hard to find anti-static products. RadioShack sells a wrist strap for only \$1.23 (<http://www.radioshack.com/product/index.jsp?productId=2103245>)! You can find a whole range of anti-static products on Amazon, too. Wherever you get them, they're a good investment.

When he's not worrying about ESD, Dan, KB6NU enjoys teaching amateur radio classes and working CW on the HF bands. For more information about his operating activities and his "No-Nonsense" series of amateur radio license study guides, go to KB6NU.Com or e-mail cwgeek@kb6nu.com.

CONTEST CORNER

WA7BNM's Contest Calendar is one of the best sources for finding out what contest you just heard, or the how to operate the contest such as the contest exchange, hours of operation, where to send logs,..etc.

WA7BNM's Contest Calendar can be found at:

www.hornucopia.com/contestcal

Although some of the contests for January are over by the time of this publishing, the following represents contests I think would be interesting (begin date listed):

January

1-Jan	ARRL Straight Key Night
	New Year RTTY Contest
	AGCW Happy New Year Contest--CW
3-Jan	NS Weekly Sprint--CW
5-Jan	ARRL RTTY Roundup
	Kid's Day--Phone
7-Jan	QRP Fox Hunt
11-Jan	UK DX BPSK63 Contest

12-Jan	North American QSO Party, CW
	NRAU-Baltic Contest, CW
	NRAU-Baltic Contest, SSB
	DARC 10 Meter Contest
18-Jan	Hungarian DX Contest
	North American QSO Party, SSB
	ARRL January VHF Contest
Jan-26	CQ 160-Meter Contest, CW

Early February

1-Feb	Vermont QSO Party
	10-10 Int. Winter Contest, SSB
	Minnesota QSO Party
	British Columbia QSO Party
	Delaware QSO Party
	Mexico RTTY International Contest
8-Feb	CQ WW RTTY WPX Contest
	New Hampshire QSO Party

TECHNICIAN LICENSE QUESTION OF THE MONTH

Found on HamRadioSchool.Com and Posted by Stu Turner, WOSTU

TECHNICIAN LICENSE QUESTION

What formula is used to calculate voltage in a circuit?

- A. Voltage (E) equals current (I) multiplied by resistance (R)
- B. Voltage (E) equals current (I) divided by resistance (R)
- C. Voltage (E) equals current (I) added to resistance (R)
- D. Voltage (E) equals current (I) minus resistance (R)

At HamRadioSchool.com we're big fans of the water analogy of electricity. Let's use the water analogy to think about this question. This question is a statement of Ohm's Law, $E=IR$, but let's think of it as the Plumbing Law.

The electromotive force (EMF, or E) is measured as voltage, and voltage is like water pressure. Think of it as the force or push behind electric current flow. High voltage, like high water pressure, pushes lots of current. Low water pressure results in a small dribble.

The current (I) is measured in amperes, or "amps." Just as water current is the volume of water molecules flowing down a river or through a pipe, electrical current may be considered as the volume of electrons flowing through a circuit.

Resistance (R) is the opposition to the flow of current. With water in a pipe resistance is encountered when an obstacle is in the flow, perhaps marbles placed in the pipe. Resistance is also encountered when the water current has to do some work, such as turning a waterwheel. Resistance may also be imposed by a narrowing of the pipe so that the water current has to squeeze into a smaller diameter of flow.

Now let's apply the Plumbing Law. Suppose you are washing the car using a water hose, a steady current (I) flowing out of the hose with no spray nozzle attached. Now you want to increase the water pressure (E) so that you can spray off the soap and possibly douse your little brother as a bonus. How can you do it?

One way you can do it is to increase the resistance (R) at the end of the hose. You place your thumb over the end of the hose, reducing the size of the area through which the current (I) has to flow through. The water pressure (E) is instantly increased by the increased resistance, and you surprise your brother easily with a good soaking thanks to the greater range provided by the increased pressure! A similar result is achieved using a spray nozzle that may be even more effective at increasing the resistance (R).

Another way to increase the pressure (E) is to stroll over to the spigot and open it wider to increase the water

current (I) flowing through the hose. Now the flow of current (I) is a greater volume, and another application of your thumb or a nozzle produces an even higher pressure stream that allows you to reach your little brother even as he runs away screaming! Fun!

So, to get higher pressure, or voltage (E), you need either higher current (I) flow, higher resistance (R), or both. The net effect on electrical voltage is multiplicative. Let's examine the response options, bottom up.

- Voltage (E) equals current (I) minus resistance (R): This does not fit the Plumbing Law. It makes no sense to subtract the resistance from the current. Even if you could, you would get a lower value of voltage as resistance becomes larger, and that does not fit the little brother spraying scenario in which greater resistance provided greater pressure. This ain't it.
- C. Voltage (E) equals current (I) added to resistance (R): This one almost makes sense, but uses addition instead of multiplication. Yes, increasing the resistance or increasing the current will provide greater voltage pressure, but to add two quantities you must have identical units of measure. (That is not the case with multiplication or division, however!) This ain't it either.
- B. Voltage (E) equals current (I) divided by resistance (R): Close, but no cigar. Think of it this way... If resistance increases you will be dividing by a larger value. If you divide by a larger value the laws of mathematics always give you a smaller result. So this equation is stating that the pressure (E) will decrease if the resistance (R) increases, and we proved the opposite of that by spraying little brother with a thumb over the end of the hose to increase resistance. Increased voltage results from increased resistance, not the other way around. Three down.
- Voltage (E) equals current (I) multiplied by resistance (R): Aha! This one makes sense. An increased pressure (E) will result from increasing either current (I) or resistance (R), and we're multiplying so the units of current and resistance do not have to match. We illustrated these effects by opening the spigot (increased current) and by reducing the hose area (thumb or nozzle at the end). And doing them both gives greater spraying reach due to the significantly increased water pressure resulting from multiplying them together. Run brother, run!

The answer to Technician question T5D02, "What formula is used to calculate voltage in a circuit?" is A: Voltage (E) equals current (I) multiplied by resistance (R).

BOB'S BLOG

A while back, [Dan KB6NU](#) noted the increasing number of [preppers getting involved in ham radio](#). [Preppers](#) are people who are actively preparing for emergencies, natural disasters and disruption of social

order. In our Technician license course, we've noticed an increase in the number of people identifying themselves as preppers. Of course, amateur (ham) radio has a long history of emergency service and disaster preparedness. FCC Rules Part 97 says this is one of the purposes of the Amateur Radio Service:

Recognition and enhancement of the value of the amateur service to the public as a voluntary noncommercial communication service, particularly with respect to providing emergency communications.



Historically, most radio amateurs approach the hobby from a technical or radio operating point of view, then find ways to apply it to emergency preparedness. The prepper tends to work the equation the other way...starting with the desire to have emergency communication capability and then working to get an amateur radio license.

Many prepper sites just give a quick overview of ham radio, positioning it with GMRS, FRS and CB radio. See [Prepper Communications](#). Articles like this one give a more complete introduction to ham radio: [The Skinny On Ham: Getting Licensed](#). This one, too: [Every Prepper Should Be A Ham](#) You may run into some creative acronyms on these prepper sites:

SHTF = "Stuff" Hits The Fan

EOTW = End Of The World

TEOTWAWKI = The End Of The World As We Know It

YOYO – You're On Your Own

There are web sites devoted to prepping with radio communications:

[Prepared Ham](#)

[RadioSurvivalist.com](#)

[RadioMaster Reports](#)

Many of these sites have useful information that may stretch your thinking on "being prepared." Of course, some of these prepper sites (not the ones listed above) are a bit over the top and may have resulted from people going off their meds. Draw your own

conclusions.

I've noticed a pattern of people creating prepper

frequency lists, such as the one shown below. (Note that some of the ham frequencies listed do not conform to generally accepted band plans.) I can see the usefulness of having some assigned frequencies but its not clear to me how they'll actually get used. I think the challenge for new prepper hams is to think through *who* they are going to communicate

with and for *what* purpose. It's also important to get familiar with the equipment and gain experience on the air, so when the EOTW happens you aren't sitting there reading the radio manual.

Whether you think of emergency communications as "When All Else Fails" or when SHTF, amateur radio is a resilient communication tool.

73, Bob KØNR

PREPPER & SURVIVALIST SHTF FREQUENCIES 2-WAY RADIO COMMUNICATIONS			
RADIO SERVICE	CHANNEL NAME	FREQUENCY MHZ	MODE DESCRIPTION
FRS UHF	FRS 3	462.6125 FM	PREPPER
GMRS UHF	GMRS17	462.6000 FM	SURVIVALIST
GMRS UHF	GMRS20	462.675+ FM	PL141.3RPTR+5MHz
PMR UHF	PMR 3	446.03125FM	PREPPER
MURS VHF	MURS 3	151.940 FM	PREPPER
CB AM	CB 3AM	26.985 AM	PREPPER
CB AM	CB 9AM	27.065 AM	HIGHWAY SAFETY
CB SSB	CB 36U	27.365 USB	SURVIVALIST
CB SSB	CB 37U	27.375 USB	PREPPER
CB FREEBAND	FB368U	27.368 USB	SURVIVALIST
CB FREEBAND	FB378U	27.378 USB	PREPPER
CB FREEBAND	FB425U	27.425 USB	SURVIVALIST
LOWBAND VHF	LOW334	33.400 FM	SURVIVALIST
HAM UHF	HAM U3	446.030 FM	PREPPER
HAM VHF	HAM 42	146.420 FM	PREPPER
HAM VHF	HAM 52	146.520 FM	HAM CALLING
HAM VHF	HAM 55	146.550 FM	SURVIVALIST
HAM HF	HAM10M	28.305 USB	PREPPER
HAM HF	HAM20M	14.242 USB	PREPPER
HAM HF	HAM40M	7.242 LSB	PREPPER NETS
HAM HF	HAM60M	5.357 USB	SURVIVALIST NVIS
HAM HF	HAM80M	3.818 LSB	PREPPER NETS
LAND SAR VHF	SAREMT	155.160 FM	SEARCH&RESUCE
MARINE VHF	MAR 16	156.800 FM	SAFETY CALLING
MARINE VHF	MAR 72	156.625 FM	BOAT PREPPER

12
9
3 3-3-3
RADIO PLAN
CHANNEL 3
EVERY 3 HOURS
FOR 3 MINUTES
6

More frequencies at: [RADIOFREEQ.WORDPRESS.COM](#)

2013 Public Domain
Source:
RADIOMASTER
REPORTS

VERSION: SHTF FREQ LIST 2013

BOB'S BLOG WEBSITE CROSS-REFERENCE

Web site (url) cross-reference:

Dan KB6NU

<http://www.kb6nu.com>

preppers getting involved in ham radio

<http://www.kb6nu.com/preppers-getting-into-ham-radio/>

Preppers

<http://en.wikipedia.org/wiki/Preppers>

Prepper Communications

<http://www.happypreppers.com/Communications.html>

The Skinny On Ham: Getting Licensed

<http://thesurvivalmom.com/2012/01/02/the-skinny-on-ham-radio-getting-licensed/>

Every Prepper Should Be A Ham

<http://blog.survival-pax.com/2013/07/every-prepper-should-be-ham.html>

GETTING AN HF ANTENNA TO WORK - PART 8

SUBMITTED TO THE Ø-BEAT BY: RALPH WDØEJA

The last article described how to use an Antenna Analyzer to measure the value of the antenna, at the antenna, with no coax attached.

Connecting a length of coax to the antenna will offer a different measurement with your analyzer at the radio end of the coax. Measuring at the radio end of the coax requires a Smith Chart calculation. You will need to know the length of coax in wavelength, velocity factor and frequency. Too much trouble! This is beyond the scope of this article and I can hardly remember how to use it. Let's make it easier.

If your Antenna Analyzer does not do a Smith Chart calculation, then it cannot give the antenna values at the radio end directly. Regretfully this is as far as the analyzer can go. You can use the Analyzer to measure SWR much like your transceiver will do, however the rest is mostly guess work. Now, what can you do?

The Noise Bridge is an inexpensive device that tells the whole story with coax. It is accurate and reliable. The Noise Bridge has 2 control settings. *X* and *R*. It has 2 connectors, *Receiver* and *Unknown*.

At the antenna, insert the *Unknown* directly to the antenna with a double male connector. Connect the *Receiver* to the coax going back to your radio.

You will have to hear your receiver out at the antenna where the bridge is. I have used the base of a cordless phone and made an adapter to plug into the head phone jack on the receiver. Now you can take the phone handset out to the work site and hear the receiver.

Turn the receiver on and set it to where you will operate. Adjust the volume so you do not blow your ears out from



the hand set. Now strut out to the antenna site.

Turn the Noise Bridge on. You will hear noise, lots of it. Turn the *X* control until the least noise is heard. Do the same for the *R* control. Repeat adjusting *X* and *R* until the noise is gone.

Look at the settings of the 2 controls. If the *X* setting is on the X_L side, then the antenna resonant point is lower than where your receiver is set. If *X* is on the X_C side it is higher than the receiver setting. When it is at 0, you are at the resonant point.

Now look at the *R* setting, this will tell you the radiation resistance of the antenna. You are hoping for 50 ohms.

This will offer a 1:1 SWR. If the reading is higher or lower, the SWR will be directly affected.

The *X* control reflects 99% of the Tuning. The *R* is a minor match or mismatch that can be compensated for easily.

Next article will go into more hands-on use of the Noise Bridge.

73, - Ralph WDØEJA,
BILAL COMPANY
137 MANCHESTER DR.,
FLORISSANT, CO. 80816 U.S.A
PH/FX: 719/687-0650
wd0eja@isotronantennas.com

LOCAL HAPPINGS

HAMFESTS

January 18th

Northern Colorado ARC Hamfest (NCARC)
Loveland, Colorado
<http://www.ncarc.net/>

Check the ARRL Rocky Mountain Division website for other activities and last minute updates:

<http://www.rockymountaindivision.org/>

ORGANIZATIONS

Pikes Peak Amateur Radio Emergency Service (PPARES)
<http://www.pparest.net>

Tri-Lakes Monument Fire Radio Association (WØTLM)
<http://www.w0tlm.com/main/>

Garden of the Gods Amateur Radio Club (GGARC)
<http://ggarc.org/>

Mountain Amateur Radio Club
<http://nx0g.org/>

Pueblo Ham Club
<http://pueblohamclub.com/>

Pueblo West Colorado Amateur Radio Club, Inc.
<http://www.qsl.net/na0pw/>

Pikes Peak FM Association (PPFMA)
<http://www.ppfma.org/>

Cheyenne Mountain Repeater Group
<http://www.qsl.net/cmrg/>

FEBRUARY MEETING

How Isotron Antennas Work

LOCAL AMATEUR RADIO EXAMINATIONS

PIKES PEAK RADIO AMATEUR ASSOCIATION (PPRAA)

When:

Feb, Apr, Jun, Aug, Oct, Dec
2nd Saturday at 9 AM

Location:

Colorado Technical University (CTU)
4435 North Chestnut
Colorado Springs, CO 80907

Directions:

<http://ppraa.org/ve-testing>

or contact:

Dan Martin
VE@PPRAA.org

MOUNTAIN AMATEUR RADIO CLUB (MARC)

When:

Jan, Mar, May, Jul, Sep, Nov
1st Saturday at 10 AM

Location:

Woodland Park
Woodland Park Library-Community Meeting RM
218 East Midland Avenue

Directions:

<http://www.nx0g.org/ve.html>

or contact:

Wes Wilson (KØHBZ)
k0hbz@arrl.net
Call (719) 687-8758

APPLICANTS WILL NEED THE FOLLOWING ITEMS AT THE SESSION:

1. A valid **PHOTO ID**, driver's license preferred (if you do not have a valid photo ID, please call for alternative identification requirements).
2. Your **FRN** or **SOCIAL SECURITY NUMBER** (now required – this includes children).
3. Your **CURRENT ORIGINAL amateur radio license** (if any) and a **PHOTOCOPY** for the VE Team to keep.
4. The **CURRENT ORIGINAL CSCEs** you have and a **PHOTOCOPY** for the VE Team to keep.
5. Cash, Check or Money Order for \$15 (standard ARRL VE Fee). Checks and money orders should be made out to either PPRAA or MARC (site dependent). This covers all exams you wish to take at this VE session.

NOTE: PPRAA and MARC VE Team policy, as with many VE Teams, is to not allow same day retests on failed exams.

PPRAA – COLORADO SPRINGS TESTING ONLY

Anyone passing their Technician Class examination at a PPRAA test session will receive a free year's membership to the Pikes Peak Radio Amateur Association.

Licensing Prep & Testing

Licensing and upgrading

Material including ARRL publication and technical books can be found locally at Centennial Electronics.

Centennial Electronics

2324 E Bijou St.
Colorado Springs, CO 80909
(719) 633-4666

Education - PPRAA

For one-on-one amateur radio license and Morse code tutoring as well as practical hams skills classes

Mike Anderson, WV7T

wv7t@arrl.net

719-229-8610

Education - HamRadioSchool.com

An integrated learning system developed by Stu Turner WØSTU and James Bucknall KDØMFO of Monument, Colorado. Stu combines his skills as an engineer and educator with his enthusiasm for Amateur Radio in this excellent learning system's books for the Technician Class and General Class licenses. James maintains the complementary web site that includes an eMagazine of informative articles and section-by-section supplements to the license preparation books.

HamRadioSchool.com available on the site, HRO Denver, and online at these retailers: Amazon.com, R&L Electronics, DX Engineering, Universal Radio.



**Membership Application
Pikes Peak Radio Amateur Association, Inc.
P.O. Box 16521, Colorado Springs, Colorado 80935**

Date: _____ New Membership Renewal

Name: _____

Address: _____

City: _____ State: _____ Zip: _____

Call: _____ License Class: _____ Telephone: _____

E-mail address: _____

Are you an ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Additional Name: _____ Call _____ Class _____ ARRL member? Yes No

Full Member - \$15.00

Full Member over 65 - \$10.00

\$____ Scholarship Fund Donation

\$____ PPRAA General Fund Donation

Family Membership (same address) - \$18.00

Family Membership (both over 65) - \$12.00